Post-doctoral researcher in computer vision applied to distributed acoustic sensing (DAS)

Job offer from the institut de physique du globe de Paris | CNRS UMR 7154

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| **Researcher in** | Seismology and Machine Learning |
| **Duration** | 12 months |
| **Affectation** | Seismology team of the Institut de physique du globe de Paris |
| **Salary** | \*\*\* |
| **Date of publication** | \*\*\* |
| **Starting date** | As soon as possible |
| **Location** | Institut de physique du globe de Paris, 1 rue Jussieu, 75005 Paris, France |

### The institut de physique du globe de Paris

A world-renowned geosciences organisation, the IPGP is associated with the CNRS and an integrated institute of the Université Paris Cité. Bringing together more than 500 people, the IPGP studies the Earth and the planets from the core to the most superficial fluid envelopes, through observation, experimentation and modelling.

The research aeras are structured through 4 main unifying themes: Interiors of the Earth and Planets, Natural Hazards, Earth System and Origins.

The IPGP is in charge of labelled observation services in volcanology, seismology, magnetism, gravimetry and erosion. And the IPGP's permanent observatories monitor the four active French overseas volcanoes in Guadeloupe, Martinique, Réunion Island and Mayotte.

The IPGP hosts powerful computing resources and state-of-the-art experimental and analytical facilities and benefits from first-class technical support. The IPGP provides its students with geosciences training that combine observation, quantitative analysis and modelling, and that reflects the quality, richness and thematic diversity of the research conducted by the IPGP teams.

### Team Department

The IPGP Seismology team covers the full breadth of the discipline—studying seismic sources such as earthquakes, slow and transient deformation, volcanic activity, landslides, glaciers, and oceanic movements, as well as the structures these waves traverse, from the near-surface to the Earth's deepest layers. Our research integrates the development of cutting-edge instruments, in situ sensor deployment, data analysis, and advanced numerical modeling.

### Missions

Distributed Acoustic Sensing (DAS) is a rapidly evolving technology that turns standard fiber-optic cables into dense seismic sensor arrays. By detecting tiny changes in backscattered light, DAS captures ground vibrations with high spatial and temporal resolution over tens of kilometers and thousands of sensing points. This technology is being deployed at European Near Fault Observatories (NFOs)—such as the Irpinia Fault (Italy) and the Corinth Rift (Greece)—to build detailed seismic catalogs, image fault structures, and improve understanding of earthquake nucleation and interaction.

A major challenge of DAS is the enormous data volume it generates, with typical deployments producing around one terabyte per day. To address this, we will develop machine learning methods that treat DAS data as images and leverage computer vision techniques to detect seismic events. This will enable fast identification of relevant time windows, allowing selective data retention and significantly reducing storage needs.

This work is part of the EU-funded TRANSFORM² project, which aims at strengthening Europe’s NFOs through the integration of advanced sensing, fiber-optic monitoring, and machine learning to improve fault monitoring, earthquake detection, and early warning systems.

### Activities

The appointed researcher will take a leading role in developing computer vision algorithms to detect seismic events within DAS record sections, treated as images. This work will build on existing tools for processing DAS data, which will be used to generate the record section images. The primary focus will be on constructing a high-quality training dataset and designing machine learning models tailored to the unique characteristics of DAS images.

### Expected Skills

### **Specific training**

### PhD in geophysics, seismology, computer science, or a related field.

### Strong background in signal processing and/or machine learning.

### Familiarity with seismic data and distributed acoustic sensing (DAS) is a strong asset.

### **Computer tools**

### Proficiency in Python or Julia, with experience using scientific libraries (e.g. NumPy, SciPy, Pandas, or Julia equivalents).

### Experience with machine learning frameworks (e.g. PyTorch, TensorFlow, scikit-learn, or Flux.jl).

### Familiarity with data visualization tools (e.g. Matplotlib, Seaborn, or Plots.jl) and version control systems (e.g. Git).

### Experience with high-performance computing (HPC) or cloud platforms is a plus.

### **Professional qualities**

### Strong analytical and problem-solving skills.

### Ability to work independently while collaborating effectively within a multidisciplinary team.

### Good communication skills, both written and verbal, in English.

### Curiosity, adaptability, and motivation to contribute to cutting-edge research at the intersection of geoscience and artificial intelligence.

### Obligations and risks

### **Work schedule**Full-time position, with a weekly workload ranging from 35h20 to 38h50, in accordance with institutional regulations.

### **Work attendance**The researcher is expected to participate in at least two team meetings per week at the laboratory. Remote work is possible one to two days per week, depending on project needs and team coordination.

### **Professional travel**The position may include occasional travel, particularly to attend meetings and workshops related to the TRANSFORM² project.

### Training and experience required

**Education**: PhD in geophysics, seismology, computer science, or a related discipline.

**Experience**: Minimum of 3 years of research or professional experience in relevant fields, ideally involving seismic data analysis, signal processing, or machine learning.

### How to apply

Interested candidates should send a CV and cover letter to:

* **Claudio Satriano** – satriano@ipgp.fr
* **Pascal Bernard** – bernard@ipgp.fr

**Application deadline**: Applications will be considered on a rolling basis until the position is filled.